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NATIONAL WAR COLLEGE

**SOWING THE SEEDS OF TRANSFORMATION: THE UNITED STATES MILITARY
BETWEEN THE CIVIL WAR AND WORLD WAR ONE**

LIEUTENANT COLONEL JOHN G. SETTER, JR., USAF
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PROFESSOR
CAPTAIN DAVID BROWN, USN

ADVISOR
COLONEL ROBERT KADLEC, USAF

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SOWING THE SEEDS OF TRANSFORMATION: THE UNITED STATES MILITARY BETWEEN THE CIVIL WAR AND WORLD WAR ONE

“[Transformation is] . . . what occurs when the application of new technologies into a significant number of military systems combines with innovative operational concepts and organizational adaptation in a way that fundamentally alters the character and conduct of conflict.”¹

At the end of the Battle of Cold Harbor, Virginia in 1864, both the Confederate and the Union soldiers were squared off against each other in trenches, each side spent after several days of brutal, murderous attacks, yet waiting to repulse any offensive attack by their opponent. This battle had featured the South's last regimental charge of the war, by the 20th South Carolina infantry regiment, which had been repulsed in a pulverizing hail of fire from artillery and experienced Union infantry outfitted with rifled weapons. The post-battle tension was such that hundreds of wounded on both sides lay in the no-man's land between the two lines, yet there was no truce, and most of those men died from lack of medical attention, while their comrades faced off at each other. Within weeks, General Robert E. Lee's Confederate forces were to create an elaborate trench system of defenses around Richmond and Petersburg in an attempt to prevent Grant's Union forces from penetrating or outflanking them. This siege was to last over seven months, as the opposing lines essentially did not move until April 1865, when Lee's forces, attempting a breakout to the West, were blocked at Appomattox, effectively ending the American Civil War.

Yet fifty years later, the European armies of Germany, France, Great Britain and other countries were locked in a similar murderous embrace, except now the cost was magnified—casualties ran into the millions for each of the major countries in the course of World War One. Apparently, the lessons of the American experience during 1861-1865 were not assimilated.

These European militaries had almost fifty years to transform themselves, but had failed. This failure to transform had enormous political, military, social, and economic cost. The stalemate of the war was broken only by the entry of the Americans into the war in 1917, who used different tactics in their military success, tilting the balance of the war toward the Allied side. How was it that the Americans had transformed themselves and the Europeans had not? What did the Americans do in the period between 1865 and 1917 that made a difference?

Transformation in warfare has been a focus for military forces for centuries. Victory has often, though not always, gone to the side that has continued to examine itself and change with the conditions and capabilities available in its age. The essence of transformation is found in the magnitude of change compared with preexisting warfighting capabilities. There are three elements that can make up a transformation. The first is the awareness of emerging technologies and capabilities, and more importantly, the integration of those emerging technologies into warfighting capability.

Second, exploiting these new and emergent technologies is dependent on the development of innovative doctrinal and operational concepts. In this element, key military leaders must ask what specific doctrinal concepts and organizations will be required to fully realize evolutionary and possibly revolutionary potential of these technologies. Given the level of change, then, these new concepts produce order-of-magnitude change, not just an incremental change.

Third, leaders involved with transformational change must seek to understand not only they can use new technologies and adaptive organizational structures, but also how an adversary could use similar technologies and organizational structures against their own forces. This third concept usually involves organizational change that codifies the changes in the previous

elements or enhances the military's ability to carry out its strategy.² In this third area, some manner of a professional forum or educational institutions must develop to cultivate ideas of transformation.

The American Civil War was called the first truly modern war, because it was the first conflict to take maximum advantage of the new efficiencies of production brought into being by the Industrial Revolution. For the first time, the entire populations of each combatant were involved. Large conscript armies were raised, requiring a huge industrial and agricultural base to feed, clothe, and supply them for war. The factory system and mass production along with technological innovations in chemistry, machine tools, and metallurgy created an explosion in military technology. New means of economic organization and increases in productivity made it possible for large numbers of men to be available for military service without serious economic dislocation, at least on the Union side. The railroad allowed transport of men and supplies to support military operations on an unprecedented scale. Development of steamboat technology enabled the Union to move large amounts of logistics efficiently by sea and made control of the navigable waterways a key strategic target. By the end of the Civil War, more than half of the Union artillery was comprised of rifled and breech-loading guns, featuring longer ranges and greater accuracy than smoothbore weapons. In addition, improved gunpowder increased the shell's velocity and range while early recoil mechanisms increased the rate of fire and overall accuracy with devastating effect. All of this killing power was harnessed and controlled with extensive use of the telegraph, speeding communications to large units in the field. Thus, this new terrible war of killing had been enabled by three "revolutions:" the economic strength of the post-industrial revolution, its ability to mobilize society and excess manpower, and the new

weapons mentioned above. But did these “revolutions” constitute a transformation? Not in this case—the severity of the horror of the war had not been predicted, and military leaders on both sides failed to appreciate all the changes that had occurred, even as they were happening. Hence, even in the third year of the war with millions of military and civilian casualties already, a slaughter like Cold Harbor could occur.

For the U.S. Army, technological changes that appeared on the battlefield by the end of the Civil War were to have dramatic impact in future years. By the end of the Civil War the totally self-contained modern cartridge with powder and bullet in a single metal container made its appearance. During the Franco-Prussian War of 1870-71, the breech-loading rifle became standard issue for European armies, as it had for the Americans in the same period. By the turn of the century, the clip and the magazine-fed rifle revolutionized infantry tactics, for those countries that recognized the concentrated killing power these weapons provided. Breech-loading magazine-fed rifles made it unnecessary for the rifleman to stand or kneel to reload. This made possible in turn the development of modern dispersed infantry tactics, which greatly increased the ability of infantry to fire and maneuver.

But the rapid development of these weapons raised difficult questions about their use in war by the U.S. Army. The Civil War had ended with the supremacy of the tactical defensive, in that direct contact by offensive forces as they tried to cross what was called “the dangerous space” had become too deadly to be a realistic plan any longer. Each of the branches of the Army—infantry, cavalry, and artillery—had to deal with the implications of these modern weapons. Defenders protected by natural terrain or constructed field works could deliver deadly fire from new breech-loading, rapidly-firing rifles and artillery pieces against attackers, mounted or unmounted.

Professional soldiers recognized these dangers, but maintained their confidence in the wisdom of offensive fighting and looked to readdress tactics in light of the developments in shooting technologies. The influence of Emory Upton and the continued thought of Army officers throughout the 1880s led to the development of the Army's first true tactical manual in 1891. Previous books on drill had focused only on the movement of formations to and across the battlefield, and leaving the tactics of formations massing fire on their opponents in full view in a manner little different from the Napoleonic Wars. This new tactical manual, developed at Fort Leavenworth, was the first worldwide to emphasize small-unit movements and how to fight on both offense and defense. This manual was also the first to introduce the squad tactics soon to be used by the 20th century armies.

This Leavenworth tactical manual did not solve all the tactical problems of the day. Many soldiers resisted change and preferred their traditional ideas. In addition, most officers had little time for study or experimentation, and the fragmentation of the Army over numerous small posts across the West made it difficult to concentrate units in order to exercise. In addition, the rapid-fire ability and accuracy of the weapons of the turn of the century still emphasized the dominance of the defensive because mobility technologies such as tanks or improved communications (like field radios) had yet to be developed, which would allow small units to move over the battlefield while remaining under the control of their commander. But it was clear the Army had recognized these technologies and attempted to implement new tactics and structures to deal with those changes.

After the Civil War, the United States Navy declined from its wartime peak of about 700 ships to 52 ships. These remaining ships were made of wood, moved by sails, and carried

muzzle-loading smoothbores. Though the Navy had six ironclads by 1874, its training, doctrine, and performance at sea reflected a post-war dormancy in equipment and thought. The Navy attempted to revive its prewar system of distant patrols, but prolonged voyages could not be made with steam-powered vessels. These steam engines of the day were inefficient and consumed enormous amounts of expensive coal. European navies could refuel at their colonial stations, but the U.S. had few such bases.

The changing trends of the 1880s and beyond gave an impetus for the U.S. Navy to transform. Emerging technologies, a growing imperialist impulse, and a growing awareness of U.S. Naval officers of their importance for a country surrounded by two oceans and superior European navies. Improvements in steam technology and shipbuilding methods and an increasing awareness by the U.S. Congress of the importance of these naval technologies led to a new “steam and steel” navy. In essence, technology joined imperialism as a spur to modernization and ultimately, transformation.³ European navies already had done much of the technological development for improved naval ships of war, blending changes in steam, armor, and improved guns (including all the improvements in artillery in the last few decades.) The Navy’s rebuilding began in 1882-1883, when Congress authorized a series of new ships built of the new technologies, including gunboats, cruisers, and battleships, equipped with steel hulls, compartmentalization, steam engines, screw propellers, electric power plants, and breechloading cannon.

But technological change was not enough. In the early 1890s, then Secretary of the Navy Benjamin F. Tracy believed that the “sea will be the future seat of empire.”⁴ Tracy had issued a report, reflecting the changing thought of naval officers of the day, that the new developments in naval technology required a clear break with previous strategies. Instead of emphasizing coastal

defense and commerce protection and raiding, Tracy emphasized a new doctrine of command of the sea based on warships that could destroy an enemy's fleet in mid-ocean.

After the turn of the century, the Navy's progression from wood and sails had progressed to the point where Theodore Roosevelt's "Great White Fleet" circled the globe in a highly publicized cruise, symbolizing that America was now a world naval power. Technology improvements continued, as battleship construction picked up, but the real changes were in the strategic and political foundations of American overseas policy. As the Navy had become more international, the professionalism of naval officers enabled the creation of an advisory body known as the General Board in 1900, which would advise on issues relating to the Navy's present and future. Healthy debate over the fleet's use and its modernization and expansion led to appreciation of even newer technologies just invented, like the airplane and the submarine. Though both were too immature to be effective in battle before World War I, just the fact that they were considered and researched indicated the presence of a transformational mindset in the U.S. Navy.

Changes in technology alone do not constitute transformation. Implementing these changes requires a continuing reeducation about these potential changes and how might they be used. As the U.S. military drifted in the post-Civil War period, dealing with Indian Wars in the west, some reformers viewed the growing global great power rivalry, looked at the increasing economic power of the U.S., and saw that a big war against a powerful adversary was not impossible. Traditionally, America had maintained a small peacetime military, the constabulary Army on frontier stations and the Navy at its stations, and then counted on rapid expansion in time of war. But these reformers and thinkers, from both services, thought this policy of

depending on rapid expansion would no longer suffice. They argued that in modern warfare the potential foes were too strong, that changes in weapons and technology had made war so complex, and that rapidly trained amateurs could not handle this complexity. The idea came about that military professionals must remain progressive in thought and action in order to utilize prewar preparations to the maximum extent possible.

One of the results in this change in thinking was the development of a more complete military educational system. In the Army, General Sherman (head of the Army 1869-1883) believed West Point was only the beginning of military education, and envisioned a pyramid of advanced schooling, culminating in a “war college.” To this extent, he reestablished the Artillery School, encouraged the development of an engineering school, and most importantly, founded the School of Application for Infantry and Cavalry at Fort Leavenworth, devoted to the “science and practice of war.” Sherman also cultivated a protégé, Emory Upton, a Civil War general whose postwar thinking and writing had deep impact on the Army of the late 19th century. While some of Upton’s thoughts were quite controversial, such the makeup of the Army between regulars and volunteers and his support of a professional staff system like the Germans, they marked a watershed. No longer just relying on lessons learned from previous conflicts, Upton’s systematic presentation of ideas, buttressed with the scholarship of the day, gave a professional air of self-improvement, indeed of transformation, that had not existed in the American Army before.

Secretary of War Elihu Root (1899-1904) led further reforms for the Army, establishing a culture of military professionalism amidst many organizational changes. Some of Root’s changes include the establishment of the Army War College and the establishment of a formal staff system designed to unify command and policy direction for the Army. Changes were made

in the structure of the fighting units and in the composition of the regular and Guard forces. The Army continued to procure more modern weapons to keep pace with European armies, and spent considerable effort attempting to deduce new structures and doctrine for using these technologies. Root's leadership was to prove crucial in the Army's success in Europe in the last year of World War One.

The Navy, too, experimented positively with developments in education and sharing of professional thought. Rear Admiral Stephen B. Luce was a strong proponent of naval education and the driving force behind the formation of the U.S. Naval Institute in 1873. Analogous to the Army's Military Service Institution, the Institute began publishing *Proceedings* as a professional forum for naval officers. Luce was also instrumental in the establishment of the Naval War College at Newport in 1884. Like Sherman and Upton, Luce also cultivated a protégé who was to become extremely influential, Captain Alfred Thayer Mahan. Mahan's *The Influence of Sea Power Upon History, 1660-1783* marked him as the world's foremost naval historian and thinker of his day. Mahan believed that the U.S. Navy must not only protect the continent, its previous mission, but must also help the country compete aggressively for world trade. To that end, a navy, Mahan argued, must gain command of the sea by defeating the enemy's ships in a decisive battle. This concept of armed aggressiveness won him world acclaim, and his support for battleship-equipped navies was influential around the world. While Mahan did not take technological change *per se* into account for his theories, only the technology available to navies in the late 19th century could fulfill his visionary and doctrinal outlook for navies in that age.

By the start of World War I, the U.S. military had sown the seeds of its transformation, having come far from the days of raw attrition and extreme bloodshed of the Civil War. It

obviously did not have all the answers, but it was prepared to think, react, and change as new technologies and warfighting concepts emerged. The Army looked at its results and the effects of the weapons, and slowly over time tried to change its thinking on offensive and defense warfare to take into account and take advantage of the new technologies. The Navy too looked at the new technologies available and converted itself to an all-steel Navy capable of operating around the world. The thinker A.T. Mahan heavily influenced its doctrine and concepts of operations, as Upton had for the Army. Both services instituted systems of professional military education to help gather lessons learned from history and to think ahead to future challenges. These transformative elements enabled the U.S. Navy to become a major naval power by the First World War, and for the Army to join the war in 1917 and help turn the defensive stalemate into a victory for the Allies a year later. Furthermore, with the seeds of transformation planted, both services were able to change and transform again after World War One, embracing new technologies such as radios, tanks, airplanes, submarines, and others, creating new warfighting concepts such as amphibious warfare, carrier air operations, and strategic bombing that would be so crucial to the success of the U.S. in World War II. Those seeds of transformation were indeed sown on the bloody fields of Cold Harbor, only to bear great fruit for our country in the years to come.

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ENDNOTES

¹ Andrew Krepinevich, "Cavalry to Computer: The Pattern of Military Revolutions," *The National Interest*, 37 (Fall 1994), 30.

² David A. Deptula, "Air Force Transformation: Past, Present, and Future," *Airpower Journal* XV, no. 3 (Fall 2001), 85.

³ Alan R. Millett and Peter Maslowski, *For The Common Defense: A Military History of the United States of America* (New York: The Free Press, 1994), 265.

⁴ Millett and Maslowski, p. 268.